

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

EATON CORPORATION,

Plaintiff,

Case No. 03-74844

vs.

HON. GEORGE CARAM STEEH

ZF MERITOR LLC, ARVINMERITOR,
INC. and ZF FRIEDRICHSHAFEN AG,

Defendants.

ORDER DENYING DEFENDANTS' MOTION FOR SUMMARY JUDGMENT
OF INVALIDITY OF CLAIMS 8 AND 9 OF U.S. PATENT 5,624,350

The '350 patent, entitled "Automated Clutch Control and Calibration", relates to method and apparatus for reengaging a clutch in a truck transmission system after the clutch has been disengaged. The essence of the invention is a way to shorten the distance the clutch has to move between events of engagement and disengagement.

Eaton filed the '350 patent application on August 28, 1995. The claimed invention purports to improve responsiveness of the clutch during clutch engagement by defining clutch control parameters corresponding to an "approach point" as well as a "touch point". "Touch point" is construed to mean "a point of incipient engagement of the clutch and requires some minimum amount of torque transfer across the clutch." An "approach point" is any "point intermediate full disengagement and the touch point, preferably almost to the touch point."

The Court has already held that claims 1, 2, 3, 5 and 6 of the '350 patent are invalid based on the Nakadani prior art reference. Defendants now raise another prior art reference, the Diplomarbeit (German bachelor's thesis) of Christian Krauss, referred to herein as the "Krauss Paper". Defendants contend that the combination of Eaton's

Cote patent and the Krauss Paper renders the remaining claims 8 and 9 of the '350 invalid as obvious. The Krauss Paper describes an early clutch control algorithm developed by defendant ZF. Mr. Krauss was an intern for ZF while he was a student at the University of Karlsruhe in 1991. The internship culminated in Mr. Krauss' 167 page Diplomarbeit, which describes the early ZF control algorithm and Mr. Krauss' work to develop a computer model of the clutch operation.

Claim 8 of the '350 patent recites three steps: (a) determining a touch point; (b) determining an approach point; and (c) causing the clutch to assume and remain at the approach point while awaiting a clutch engagement command. Claim 9 requires causing the clutch to move rapidly to the touch point and then causing further engagement in a controlled and modulated manner.

I. Printed Publication

The "printed publication" bar is found in 35 U.S.C. § 102:

A person shall be entitled to a patent unless -

(B) the invention was patented or described in a printed publication in this or a foreign country . . . more than one year prior to the date of the application for patent in the United States. . . .

The bar is grounded on the principle that once an invention is in the public domain, it is no longer patentable by anyone. In re Hall, 781 F.2d 897, 898 (Fed. Cir. 1986) (citing In re Bayer, 568 F.2d 1357, 1361 (CCPA 1978)).

A reference will be deemed to be a "printed publication", and therefore prior art, if it was "available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it." In re Wyer, 655 F.2d 221, 226 (C.C.P.A. 1981). Public accessibility is the touchstone of this inquiry. In re Hall, 781 F.2d at 899. The "critical date" for purposes of determining whether a reference is

a prior art printed publication is one year before the patent application was made. In this case, the critical date is August 28, 1994. The decision whether a particular reference is a printed publication “must be approached on a case-by-case basis.” Id.

Mr. Krauss’ studies were at the University of Karlsruhe’s Institute for Machine Construction and Vehicle Engineering (the “Institute”). Defendant contends that the Krauss Paper has been available to the public at the Institute library since early 1992. The evidence in support of this position is provided by: Professor Albert Albers, chair of the Institute and responsible for the Institute library since 1996; Dr. Michael Frey, supervisor of student research papers and dissertations; Mr. Krauss; library records; and a formal statement by the Institute regarding the Krauss Paper. The Institute selected Professor Albers and Dr. Frey to explain the library procedures for purposes of this lawsuit. The person in charge of maintaining student papers at the time the Krauss Paper was submitted, Prof. Gnadler, has since retired and was not deposed in this case.

A. Admissibility of Evidence

1. Witness Testimony

Under FRE 602, “[a] witness may not testify to a matter unless evidence is introduced sufficient to support a finding that the witness has personal knowledge of the matter.” The court in Ajinomoto Co. v. Archer-Daniels-Midland Co. recognized that “general library practice may be relied upon to establish the approximate time when a thesis became accessible.” 1998 WL 151411 at *38 (D. Del. Mar. 13, 1998) (citing In re Hall, 781 F.2d at 899). However, the court found the testimony in that case not competent because the witness “had no actual first-hand knowledge of the procedures employed by the university libraries, being a doctoral candidate and not a member of

the library personnel.”

The Hall court concluded an affidavit from the director and manager of the library’s loan department was competent evidence that a particular dissertation was accessible prior to the critical date. 781 F.2d at 899. In Hall, the affiant was found to have sufficient personal knowledge to set forth the library’s general practice for indexing, cataloging, and shelving theses, and, based upon that knowledge, estimating the time it would have taken to make the thesis available to the interested public. Id. at 899.

Professor Albers has been the head of the Institute and responsible for the Institute library since 1996. Albers investigated the Institute’s prior procedures for handling Diplomarbeiten when he took over his position from Professor Gnadler in 1996. In preparing a response to the parties’ request for information about the Krauss Paper, Professor Albers reviewed the library’s business records and conducted an investigation which involved checking with individuals who were at the Institute in 1991. Professor Albers testified to general library procedures in the 1991-1992 time frame based on his investigation. He made it clear during his examination that he was not testifying specifically about the Krauss Paper, but generally about routine Institute library practices. Based on his knowledge about routine library practices, Professor Albers opined that, “[f]rom taking over the library I know that there was an established process, and in view of this process, it is most likely that the paper was also accessible to the public in the usual way in 1991.” (Albers Trans. p. 7). Professor Albers’ testimony about the public accessibility of the Paper is admissible under FRE 602 because it is based on his investigation, his experience at the Institute since 1996, and on his review of the library’s business records relating to the Paper.

Dr. Frey has been associated with the university for over twenty years, first as a student and then as an employee. As a student, Dr. Frey worked part-time for the Institute from 1991 to 1993. From 1993 through 1996, Dr. Frey was a full-time employee of the Institute. Dr. Frey has never worked at the Institute library. Dr. Frey personally observed how the library processed and maintained Diplomarbeiten before August 28, 1994. Dr. Frey based his conclusion that the Krauss Paper was indexed, shelved, and accessible to the public in 1991-1992 on his understanding of general library procedures and his review of library records. The Court concludes that Dr. Frey's testimony regarding the public accessibility of the Krauss paper is admissible under FRE 602 because of his review of the records and his personal knowledge of general library practices at the relevant time.

Dr. Frey and Professor Albers refused to sign the Institute's May 2006 statement, because it explained "the general handling of theses at the Institute and describe[d] the documents relating to the [Paper]", and "they can only reconstruct the circumstances from the documents that are available at the Institute." (Def. Br. Ex. 5). This disclaimer relates to the witnesses' specific knowledge of the Krauss Paper, which they repeatedly explain is due to their lack of first hand knowledge. The witnesses make clear that their testimony is only in regard to general library practices and record keeping. The refusal to sign the statement is not fatal to the Court's acceptance of Dr. Frey's and Professor Albers' testimony of the general handling of student papers by the Institute library, nor to their inferences regarding the Krauss Paper based on those general practices.

2. Records

The library records must be authenticated, as a business record, either by a custodian or other qualified witness. FRE 803(6). Rule 803(6) requires that the

proponent of the record evidence show: (1) the library records were made according to normal library procedures at or near the time the library processed the shelved Krauss Paper, in 1991-1992, by knowledgeable employees associated with the library; (2) the library maintained the records in the course of its regular activities; and (3) it was the library's regular practice to maintain records of this type for Diplomarbeiten.

Dr. Frey testified that he did not know of any written policies regarding the handling of Diplomarbeiten, but he said he was familiar with the manner in which the library handled Diplomarbeiten according to its usual procedures. (Frey Trans. p. 47). Both witnesses consistently testified to their familiarity with general library procedures regarding the handling of Diplomarbeiten during the time frame at issue. This testimony included a thorough description of library records, from which the witnesses reconstructed what likely happened to the Krauss Paper.

Dr. Frey and Professor Albers are qualified witnesses for purposes of authenticating the records in this case. Therefore, the following library records are admissible under Rule 803(6):

DX-301 - Grading Card

DX-304 - Catalog File Card

DX-302 - Bibliographical List

Library Borrowing Cards

B. Publicly Accessible

The Institute library maintains a grading card, which indicates that Mr. Krauss submitted his Paper to the Institute on December 2, 1991. The Institute completed its academic examination of the Paper on January 10, 1992. According to its normal procedures, the library would have received a copy of the Paper within a few weeks

after completion of the academic examination. Library employees assigned a sequential number to the Paper, created the catalog file card, and added the Paper to a bibliographical list of Diplomarbeiten available at the library. Both the file card and the bibliographic list were accessible to anyone who visited the library, and visitors were free to make photocopies of the bibliographic list.

Routine library procedures provide that a Diplomarbeit would be catalogued, shelved and made available to anyone who visited the library. Visitors are free to take a Diplomarbeit off the shelf and review it, or even borrow it from the library. Records indicate that the Krauss Paper was borrowed in September 1996 and October 1997.

Dr. Frey has no personal knowledge of whether the Paper was available at the Institute on the Critical Date. He reviewed library records and reconstructed that the Paper may have been available at the library “shortly after Nov. 1991.” Dr. Frey testified that the only library personnel who could have received the Paper was Prof. Gnadler or his assistant. Dr. Frey testified that Prof. Gnadler maintained a private cabinet, accessible only to himself, in which both confidential and non-confidential student papers were stored. (Ex. 1, Frey Tr. at 21-22). Mr. Krauss was deposed and stated that he submitted copies of the Paper to ZF and the University. He does not know if a copy was maintained at the Institute.

The Court will first examine a line of cases which resulted in a finding of public accessibility. An Australian patent application, which was laid open to the public and “properly classified, indexed or abstracted” to enable public access to the application, was found to be publicly accessible. In re Wyer, 655 F.2d at 226-27. The court in that case found an intent to publicize and various disseminating activities in making its determination. Id. In a case involving

posters displayed at two professional conferences, the court concluded the posters were printed publications because their entire purpose was public communication of the relevant information. In re Klopfenstein, 380 F.3d 1345, 1347-50 (Fed. Cir. 2004). A Canadian patent application, properly abstracted, indexed and catalogued, was found to be a printed publication. The court explained, “[T]he [Canadian] patent was classified and indexed, similar to the abstract in Wyer, further providing a road map that would have allowed one skilled in the art to locate the [patent] application.” Bruckelmyer v. Ground Heaters, Inc., 445 F.3d 1374, 1379 (Fed. Cir. 2006).

The Federal Circuit Court concluded that a doctoral thesis at Freiburg University in Germany was a printed publication. In so doing, the court rejected the “legal argument that a single cataloged thesis in one university library does not constitute sufficient accessibility to those interested in the art exercising reasonable diligence.” In re Hall, 781 F.2d at 900.

There is another line of cases which illustrates a lack of public accessibility. One case involved a graduate thesis in a university library, where the library had not catalogued or placed the thesis on the shelves. Only three faculty members even knew about the thesis. The court found that the thesis did not constitute a printed publication because a customary search would not have rendered the work reasonably accessible even to a person informed of its existence. In re Bayer, 568 F.2d at 1358-59, 1361-62. Another case dealt with a thesis in a library with an alphabetical index by the author’s name. The court found no public accessibility because “the only research aid in finding the theses was the student’s name, which of course, bears no relationship to the subject of the student’s thesis.” In re Cronyn, 890 F.2d 1158, 1161 (Fed. Cir. 1989).

In a recent case, the court considered the public accessibility of a prepublication

paper that was sent via email and placed on a file transfer protocol server for seven days as a backup to email. The server did not contain an index or catalogue, which would be necessary to conduct customary and meaningful research. The paper was posted on the server solely to facilitate peer review by a review committee in preparation for later publication. In order to locate the paper, a person of ordinary skill in the art who *knew* of the paper would not have found the reference without precise directions. The court concluded that the paper was not catalogued or indexed in a meaningful way and was not intended for dissemination to the public. SRI International, Inc. v. Internet Security Systems, Inc., 511 F.3d 1186, 1196-97 (Fed. Cir. 2008).

Turning to the facts of this case, Mr. Krauss' Paper is entitled, "Model formation and simulative examination of a commercial vehicle drive train with automated clutch." The library did not maintain a subject matter index, so an interested person would have to peruse the bibliographical list or catalog file card. The catalog file card and the bibliographical list are both arranged by the sequential number each Diplomarbeit is given after it is received by the library. Therefore, the Krauss paper was not organized by subject matter, or even by its title, but rather by the number it was assigned by the library based on its submission date.

Defendant contends that the specialized vehicular engineering focus of the Institute for Machine Construction and Vehicle Engineering serves as a de facto subject matter index. In addition, Albers and Frey testified that a vehicular engineer interested in a particular vehicle engineering topic would know to check the Institute for relevant publications.

The standard of public accessibility is whether the publication was intended for dissemination to the public and whether a person of ordinary skill in the art in 1994

would have been able to readily find the reference. The Court concludes that there is a genuine issue of fact in this regard. This issue will be submitted to the jury at trial, by way of a special interrogatory.

II. Obviousness

A. Krauss¹

The Krauss Paper teaches a manner to shorten the time required to engage the clutch by causing the clutch to assume and remain in a position called the “Anlegepunkt” while awaiting a clutch engagement command. Anlegepunkt is between the fully disengaged position and the torque takeover position. When the clutch is at the Anlegepunkt, “the separation of the drive line is guaranteed,” which means that the clutch transfers no torque. During a shift, Krauss teaches that the clutch initially engages from the Ruhepunkt to the Anlegepunkt, where it awaits a clutch engagement command. If the driver presses the accelerator pedal beyond a certain threshold, the control system begins to close the clutch from the Anlegepunkt. The first part of the clutch travel is in the “quick range.” The clutch travels quickly through the “quick range,” making a “free travel bypass from the Anlegepunkt to a point in which the clutch is already transmitting torque,” after which further engagement of the clutch is performed in a regulated phase. (Ex. 1B, Krauss at 84; Ex. 1, Davis Decl. at ¶ 7).

B. Cote

The Court previously concluded that Cote teaches the step of determining a touch point. “Cote clearly describes the clutch moving rapidly from the fully disengaged position to the position of incipient or almost incipient engagement, and then to fully

¹The Court will consider the Krauss publication to be prior art for purposes of its obviousness discussion.

engaged in a modulated manner.”

C. Combination

The Supreme Court has held that expert testimony may be considered to understand why it would have been obvious to one of ordinary skill in the art to combine the prior art in a particular way. “[T]he analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” KSR Int’l Co. v. Teleflex, Inc., 127 S.Ct. 1727, 1741 (2007).

Obviousness may be established “by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent’s claim.” Id. at 1742. The focus should be on whether a given modification of the prior art would have provided one of ordinary skill in the art with a predictable solution. “If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.” Id. at 1740.

Dr. Davis explains that Krauss and Cote are directed to reducing the duration of torque interruption during a shift. (Davis Decl. ¶ 26). Krauss reduces the time by advancing the clutch to the approach point (Anlegepunkt) before receiving the clutch engagement command (while waiting for the driver to actuate the accelerator pedal). (Davis Decl. ¶ 27). This gives the clutch a head start toward engagement. After the driver presses the accelerator pedal, Krauss further reduces the time by moving the clutch rapidly through the first portion of the clutch engagement, the free-travel bypass “quick range,” to a point in which the clutch transmits torque, before further controlled engagement. (Davis Decl. ¶ 27, 29).

Cote provides further refinement of the transition from rapid engagement to the

controlled engagement, specifically suggesting that the transition should occur at the touch point. “It is highly desirable to have an accurate means to predict the conditions at which incipient engagement will occur, and to switch the actuator from the rapid unmodulated to the modulated mode of operation just prior to the occurrence of the predicted condition.” (Davis Decl. ¶ 28).

According to Dr. Davis, one of ordinary skill in the art would have recognized that the Krauss algorithm could be improved by using the detailed Cote touch point determination to set the transition from rapid to modulated engagement. (Davis Decl. ¶ 29). It would have been obvious to one of ordinary skill in the art that combining the Krauss approach point and the Cote touch point would both reduce the duration of torque interruption and ensure a smooth transition from rapid clutch engagement to more modulated engagement. (Davis Decl. ¶ 30). Instead of causing the clutch to wait at the fully disengaged position (Cote), Davis explains that one of ordinary skill in the art would have recognized that the clutch could be moved to the approach point *before* receiving a clutch engagement command (Krauss). (Davis Decl. ¶ 30).

Plaintiffs point out that most of the prior art in this case deals with attempts to improve automatic clutch control during shifts. This art, which spans over thirty years, shows a long felt but unresolved need for a solution that finds the best balance between fast and smooth clutch engagement. (Caulfield Decl. ¶ 36-37). According to plaintiffs’ expert, the Krauss Paper itself shows the failed attempt of defendants in 1991 to achieve this goal. (Caulfield Decl. ¶ 38). Krauss describes the work in this field as “intensive”:

In order to decisively remove the burden from the driver in the case of continuously rising traffic volume intensive work is being conducted in the realization of automated manual transmissions in commercial vehicle

manufacturing. This requires an automated clutch or to be more precise an automated clutch control system for starting and shifting.

Krauss Paper, § 1.1. Secondary considerations, such as long felt but unresolved needs and failure of others, may “be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” KSR, 127 S.Ct. at 1730 (citing Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966)).

In light of the body of work being done in the field of automated manual transmissions in commercial vehicles, the Court cannot say as a matter of law that it would have been obvious to one skilled in the art to combine the Cote and Krauss references in order to come up with the invention covered by claims 8 and 9 of the ‘350 patent. This too, must be an issue resolved by the jury. Therefore, even if the Krauss Paper is found to be prior art, summary judgment of invalidity of claims 8 and 9 is DENIED.

Dated: April 3, 2008

S/George Caram Steeh
GEORGE CARAM STEEH
UNITED STATES DISTRICT JUDGE

CERTIFICATE OF SERVICE

Copies of this Order were served upon attorneys of record on April 3, 2008, by electronic and/or ordinary mail.

S/Josephine Chaffee
Deputy Clerk